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**TITLE:** The JPL Deep-Well Mid-Infrared Array Camera

**AUTHOR:** Michael E. Ressler, Michael W. Werner  
Jet Propulsion Laboratory, California Institute of Technology  
MS 169-327, 4800 Oak Grove Drive, Pasadena, CA 91109.

and

Jeff Van Cleve  
Center for Radio Physics and Space Research  
Cornell University, Ithaca, NY 14853

We describe the development of a mid-infrared camera intended for use at the Hale 5-m telescope and at the NASA Infrared Telescope Facility. The camera is based on 11 Rockwell International's IR-16  $128^2$  Si:As IBC array. This array is unique in that it has a full well depth of approximately 25 million electrons. This property, along with its 16 outputs, will allow the use of traditional broadband astronomical filters (N and Q) with a reasonable field-of-view. Measured performance indicates that this array has a read noise of 800 electrons (negligible when compared to the shot noise from a 25 million electron well) and shows linearity deviations of  $< 1\%$  up to 65% of full well.

Our primary science interest of high angular resolution at Palomar drove the choice of platescale; we have settled on 0.15 arcsec/pix at the 5-m (20 arcsec FOV) to allow Nyquist-sampled images at wavelengths  $> 7.5 \mu\text{m}$ . The realization that the same optical configuration will allow 0.5 arcsec pixels at the IRTF (1 arcmin FOV) and Nyquist-sampled images at wavelengths  $> 15 \mu\text{m}$  naturally gives this camera a dual role: high spatial resolution  $10 \mu\text{m}$  imaging at Palomar, and wide-field  $20 \mu\text{m}$  imaging at the IRTF. The camera has a broad complement of filters to allow a wide range of imaging experiments: broadband M, N, and Q, the six  $10 \mu\text{m}$  silicate filters, a 1% resolution  $14 \mu\text{m}$  circular variable filter, and narrowband  $20 \mu\text{m}$  filters at 18.1, 19.8, 21.2, and  $24.5 \mu\text{m}$ . We estimate that the  $3\sigma/1\text{min}$  point source sensitivity will be of order 3 mJy with the N filter at Palomar and about 20 mJy with Q at the IRTF.

In this work, we describe the array and its operation in detail. Performance data (noise, linearity, responsivity, etc.) taken in the Infrared Detector Lab at JPL are presented. We also present an overview of the camera design, discussing the decisions of dewar design, control electronics, and host computers.

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